6 United States Energy Use

The information in this chapter shows Wisconsin's energy use in the national context. Where United States energy use data are presented, the Wisconsin Office of Energy Independence has adjusted some national figures to make more appropriate per capita comparisons with Wisconsin data. For example, national data for the thermal equivalent of hydroelectric kilowatt hours generated were adjusted to the same Btu-per-kilowatt-hour basis as the Wisconsin data. All of the adjustments are annotated in the tables for per capita energy use.

In 2007, world crude oil production was 73.3 million barrels per day, an decrease of 0.3 percent from a year earlier.[1] The Organization of Petroleum Exporting Countries produced 43 percent of the world's crude oil in 2007. The top four producers of crude oil were Russia (12.9%), Saudi Arabia (11.9%), the U.S. (7.0%) and Iran (5.3%).

Natural gas use increased across the nation by 5.4 percent (measured in trillions of cubic feet). Domestic natural gas production increased 3.2 percent, while net imports (primarily from Canada) increased 10.1 percent. Working gas in storage decreased .4 percent compared to a year ago. In contrast, the U.S. is a net exporter of coal, with net exports in 2007 of 22.8 million tons, a 70 percent increase over the previous year.

In 2007, when the resource energy used to produce electricity imported into Wisconsin is included, Wisconsin's per capita energy consumption was 99.1 percent of the national average. When comparing Wisconsin's 2007 per capita energy use to the other 49 states and the District of Columbia, Wisconsin ranks 28th out of 51 in per capita energy consumption.

[1] This figure does not include oil sands or other unconventional oil sources.

United States Resource Energy Consumption, by Type of Fuel 1970-2007

(Quadrillions of Btu and Percent of Total)

In 2007, total energy consumption in the United States increased 1.5 percent, with slight dips for petroleum (0.5 percent) and renewable energy (2.9 percent), and increases for natural gas (6.3 percent), coal (1.3 percent) and nuclear energy (2.4 percent).

Year	Petroleum		Natural Gas		Coal		Nuclear		Renewable[a]		Total
1970	29.5	(43.4%)	21.7	(31.9%)	12.3	(18.1%)	0.2	(0.3%)	4.3	(6.3%)	68.0
1975	32.7	(45.4)	20.0	(27.7)	12.7	(17.6)	1.9	(2.6)	4.8	(6.7)	72.1
1980	34.2	(43.6)	20.4	(26.0)	15.4	(19.6)	2.7	(3.4)	5.8	(7.4)	78.5
1985	30.9	(40.1)	17.9	(23.2)	17.5	(22.7)	4.2	(5.5)	6.5	(8.4)	77.0
1990	33.6	(39.6)	19.7	(23.3)	19.2	(22.6)	6.1	(7.2)	6.1	(7.2)	84.7
1995	34.6	(37.9)	22.8	(25.0)	20.1	(22.0)	7.1	(7.8)	6.7	(7.3)	91.2
2000	38.3	(38.7)	23.9	(24.2)	22.6	(22.9)	7.9	(8.0)	6.2	(6.2)	98.8
2001	38.3	(39.8)	22.9	(23.8)	21.9	(22.7)	8.0	(8.3)	5.2	(5.4)	96.3
2002	38.2	(39.1)	23.6	(24.2)	22.0	(22.5)	8.2	(8.4)	5.8	(5.9)	97.8
2003	38.8	(39.6)	23.0	(23.4)	22.4	(22.8)	8.0	(8.2)	6.0	(6.1)	98.1
2004	40.3	(40.2)	23.0	(22.9)	22.7	(22.6)	8.2	(8.2)	6.1	(6.0)	100.3
2005	40.4	(40.2)	22.9	(22.8)	22.8	(22.7)	8.2	(8.1)	6.1	(6.1)	100.4
2006[r]	40.0	(40.1)	22.2	(22.2)	22.5	(22.5)	8.2	(8.2)	6.9	(6.9)	99.8
2007	**39.8**	**(39.3)**	**23.6**	**(23.3)**	**22.8**	**(22.5)**	**8.4**	**(8.3)**	**6.7**	**(6.6)**	**101.3**

[a] Includes net imports of electricity.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 1.3 [DOE/EIA-0035 (2008/03)] (March 2008).

United States Resource Energy Consumption, by Economic Sector[a], 1970-2007

(Quadrillions of Btu and Percent of Total)

During 2007, the biggest jumps in energy use were in the residential (4.3 percent) and commercial (4 percent) sectors. Energy use in the industrial sector decreased 0.3 percent, while in the transportation sector, energy use rose 0.7 percent.

Year	Residential		Commercial		Industrial		Transportation		Total[b]
1970	13.7	(20.5%)	8.3	(12.4%)	28.6	(42.9%)	16.1	(24.1%)	66.7
1975	14.9	(21.0)	9.5	(13.4)	28.4	(40.0)	18.2	(25.6)	71.0
1980	15.9	(20.7)	10.6	(13.8)	30.6	(39.8)	19.7	(25.7)	76.8
1985	16.1	(21.5)	11.5	(15.3)	27.3	(36.4)	20.1	(26.8)	75.0
1990	16.9	(20.0)	13.3	(15.7)	31.9	(37.7)	22.5	(26.6)	84.6
1991	17.4	(20.6)	13.5	(15.9)	31.5	(37.3)	22.1	(26.2)	84.5
1992	17.3	(20.2)	13.4	(15.6)	32.7	(38.0)	22.5	(26.2)	85.9
1993	18.2	(20.8)	13.8	(15.7)	32.7	(37.3)	22.9	(26.1)	87.6
1994	18.1	(20.3)	14.1	(15.8)	33.6	(37.6)	23.5	(26.3)	89.2
1995	18.7	(20.4)	14.7	(16.1)	33.9	(37.2)	24.0	(26.3)	91.2
1996	19.6	(20.8)	15.2	(16.1)	34.9	(37.0)	24.5	(26.0)	94.2
1997	19.1	(20.1)	15.7	(16.6)	35.2	(37.1)	24.8	(26.2)	94.7
1998	19.1	(20.0)	16.0	(16.8)	34.8	(36.6)	25.4	(26.6)	95.1
1999	19.6	(20.3)	16.3	(16.9)	34.7	(35.8)	26.1	(27.0)	96.8
2000	20.5	(20.7)	17.1	(17.3)	34.5	(34.9)	26.7	(27.0)	98.8
2001	20.1	(20.9)	17.2	(17.9)	32.7	(34.0)	26.3	(27.3)	96.3
2002	20.9	(21.4)	17.4	(17.8)	32.7	(33.4)	26.8	(27.4)	97.8
2003	21.2	(21.6)	17.4	(17.7)	32.5	(33.1)	27.0	(27.5)	98.1
2004	21.2	(21.1)	17.7	(17.6)	33.5	(33.4)	27.9	(27.8)	100.3
2005	21.7	(21.6)	18.0	(17.9)	32.5	(32.3)	28.3	(28.2)	100.4
2006[r]	20.8	(20.8)	17.7	(17.7)	32.5	(32.6)	28.8	(28.9)	99.8
2007	**21.7**	**(21.4)**	**18.4**	**(18.1)**	**32.4**	**(31.9)**	**29.0**	**(28.6)**	**101.5**

[a] Agricultural energy use allocated between residential and commercial sectors.

[b] Numbers may not match with previous pages due to independent rounding.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 2.1 [DOE/EIA-0035 (2008/03] (March 2008).

Sources of U.S. Crude Oil and Petroleum Products 1975-2007

(Thousands of Barrels Per Day)

In 2007, U.S. petroleum use increased 0.05 percent. Since 1985, U.S. consumption of petroleum products has increased almost 31.6 percent. During this same period, U.S. crude oil production has decreased 43 percent (lower 48 production fell 38.7 percent). This resulted in a 165 percent increase in imports since 1985, with a corresponding 227 percent increase in imports from the Organization of Petroleum Exporting Countries (OPEC). In 2007, U.S. imports of crude oil and petroleum products decreased 2.0 percent, and imports from OPEC increased 8.4 percent.

Year	U.S. Petroleum Use	U.S. Field Production[a]	U.S. Crude Oil Production from Oil Wells	Natural Gas Plant Liquids from U.S. Natural Gas Wells[b]	Crude Oil from Wells in Lower 48 States	U.S. Crude Oil and Product Exports	U.S. Crude Oil and Product Imports (Total)[c]	U.S. Crude Oil and Product Imports from OPEC	Imports as a Percent of U.S. Petroleum Use	OPEC Imports as a Percent of U.S. Imports	Imports as a Percent of U.S. Crude Oil Production & Imports
1975	16,322	10,007	8,375	1,633	8,184	209	6,056	3,601	37.1%	59.5%	42.0%
1980	17,506	10,170	8,597	1,573	6,980	544	6,909	4,300	39.5%	62.2%	44.6%
1985	15,726	10,581	8,971	1,609	7,146	781	5,067	1,830	32.2%	36.1%	36.1%
1990	16,988	8,914	7,355	1,559	5,582	857	8,018	4,296	47.2%	53.6%	52.2%
1995	17,725	8,322	6,560	1,762	5,076	949	8,835	4,002	49.8%	45.3%	57.4%
2000	19,701	7,733	5,822	1,911	4,851	1,040	11,459	5,203	58.2%	45.4%	66.3%
2001	19,649	7,670	5,801	1,868	4,832	971	11,871	5,528	60.4%	46.6%	67.2%
2002	19,761	7,626	5,746	1,880	4,761	984	11,530	4,605	58.3%	39.9%	66.7%
2003	20,034	7,400	5,681	1,719	4,706	1,027	12,264	5,162	61.2%	42.1%	68.3%
2004	20,731	7,228	5,419	1,809	4,510	1,048	13,145	5,701	63.4%	43.4%	70.8%
2005	20,802	6,895	5,178	1,717	4,314	1,165	13,714	5,587	65.9%	40.7%	72.6%
2006	20,687	6,841	5,102	1,739	4,361	1,317	13,707	5,517	66.3%	40.2%	72.9%
2007[p]	**20,698**	**6,879**	**5,103**	**1,776**	**4,384**	**1,399**	**13,439**	**5,983**	**64.9%**	**44.5%**	**72.5%**

[a] Includes crude oil, natural gas plant liquids and a small amount of other hydrocarbons and alcohol.

[b] Natural gas liquids recovered from natural gas in gas processing plants and, in some situations, from natural gas field facilities.

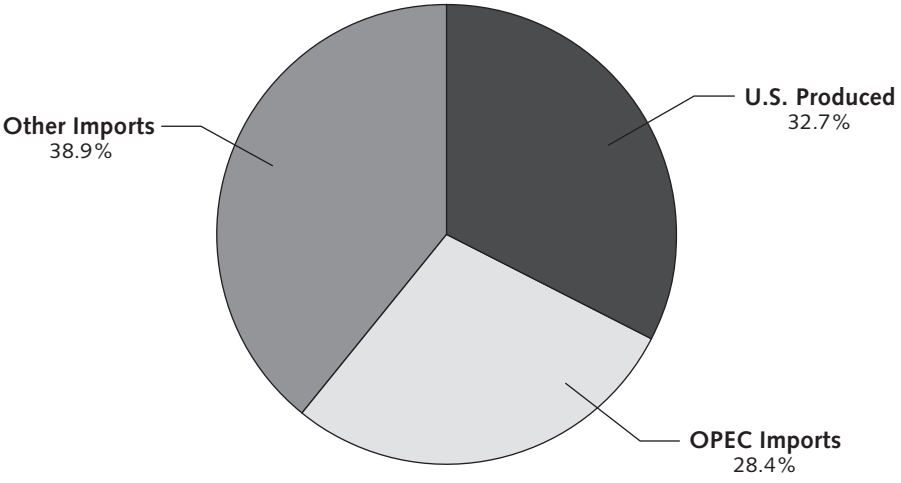
[c] Includes crude oil imports for the Strategic Petroleum Reserve (SPR).

[p] Preliminary.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 3.1, 3.3a and 3.3b [DOE/EIA-0035(2008/03)] (March 2008).

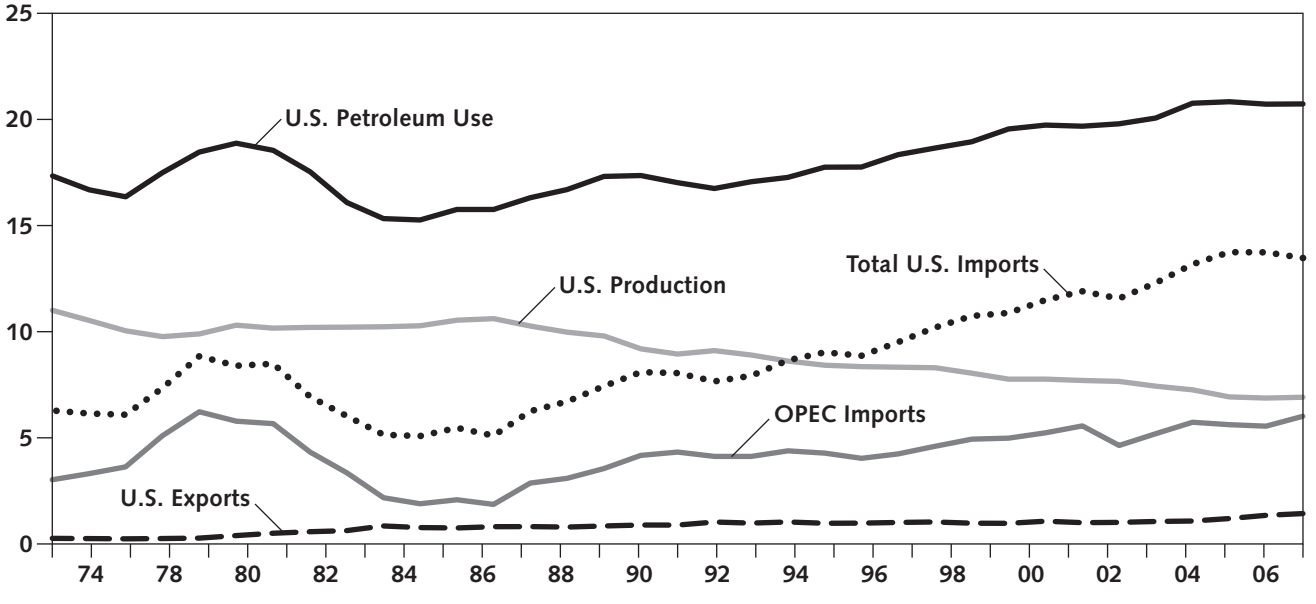
U.S. Petroleum Use Domestically Produced and Imported 2007

(Percent)



U.S. Petroleum Use, Production, Imports and Exports 1973-2007

(Millions of Barrels Per Day)

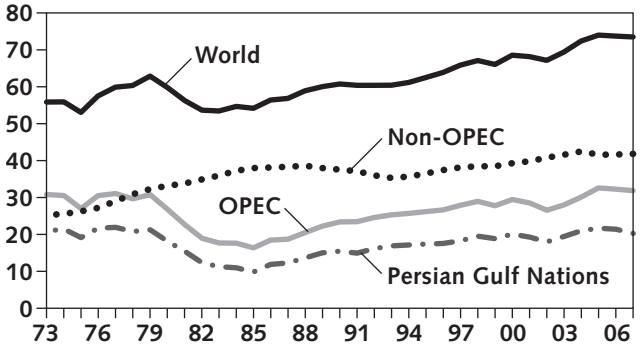


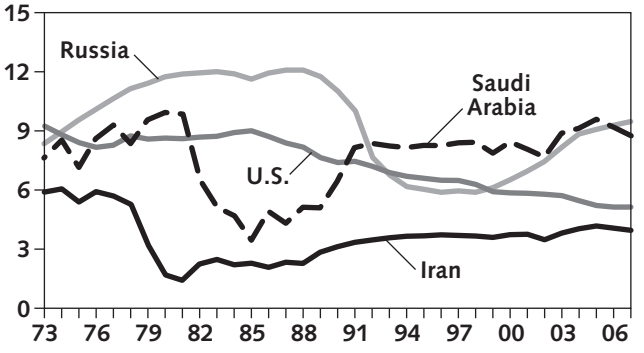
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035(2008/03)] (March 2008).

World Crude Oil Production[r] 1973-2007

(Million Barrels Per Day)

In 2007, world production of crude oil was 73.31 million barrels per day, an decrease of 0.3 percent from a year ago. The Organization of Petroleum Exporting Countries (OPEC) produced 43.2 percent of the world's crude oil in 2007. The top four producers of crude oil in 2007 were Russia (12.9 percent), Saudi Arabia (11.9 percent), the U.S. (7 percent) and Iran (5.3 percent) of the world's crude oil.





Year	World	Non-OPEC	OPEC[b]	Persian Gulf Nations[c]	Major Crude Oil Producers			
					U.S.	Saudi Arabia	Iran	Russia[a]
1973	55.68	25.05	30.63	20.67	9.21	7.60	5.86	8.32
1975	52.83	26.06	26.77	18.93	8.37	7.08	5.35	9.52
1980	59.60	32.99	26.61	17.96	8.60	9.90	1.66	11.71
1985	53.98	37.80	16.18	9.63	8.97	3.39	2.25	11.59
1990	60.57	37.37	23.20	15.28	7.36	6.41	3.09	10.98
1995	62.33	36.33	26.00	17.21	6.56	8.23	3.64	6.00
2000	68.37	39.10	29.27	19.89	5.82	8.40	3.70	6.48
2005[r]	73.81	41.40	32.41	21.50	5.18	9.55	4.14	9.04
2006[r]	73.54	41.46	32.08	21.23	5.10	9.15	4.03	9.25
2007[p]	**73.31**	**41.64**	**31.67**	**20.08**	**5.10**	**8.72**	**3.92**	**9.44**

[a] Prior to 1992, production was for the former U.S.S.R.

[b] The OPEC countries include the Persian Gulf nations (with the exception of Bahrain) and Algeria, Indonesia, Libya, Nigeria and Venezuela.

[c] The Persian Gulf nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates.

[p] Preliminary.

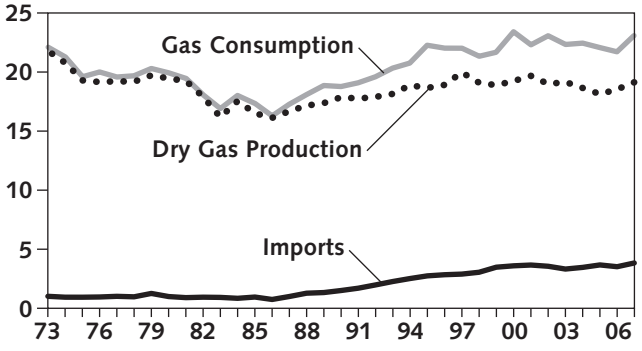
[r] Revised.

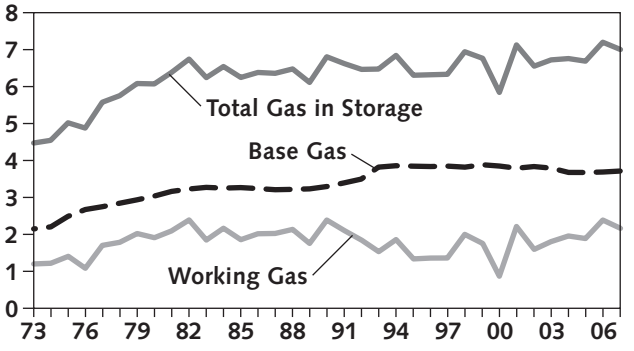
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 11.1a and 11.1b [DOE/EIA-0035 (2008/03)] (March 2008).

United States Natural Gas Production, Imports, Consumption and Storage[r], 1973-2007

(Trillions of Cubic Feet)

In 2007, U.S. natural gas consumption increased 6.4 percent. While domestic natural gas production increased 3.3 percent, net imports, primarily from Canada, increased 9.2 percent. Working gas[c] in storage decreased 6.2 percent. This reflects a change from 2006, where consumption and net imports decreased and gas in storage increased. The reversal of gas production, consumption and storage is likely due to 2007's cold winter.





Year	U.S. Dry Natural Gas Production[a]	Net Imports	Consumption	Natural Gas in Underground Storage Year End		
				Base Gas[b]	Working Gas[c]	Total
1973	21.731	0.956	22.049	2.864	2.034	4.898
1975	19.236	0.880	19.538	3.162	2.212	5.374
1980	19.403	0.936	19.877	3.642	2.655	6.297
1985	16.454	0.894	17.281	3.842	2.607	6.449
1990	17.810	1.447	19.174	3.868	3.068	6.936
1995	18.599	2.687	22.207	4.349	2.153	6.502
2000	19.182	3.538	23.333	4.352	1.719	6.071
2005[r]	18.074	3.612	22.011	4.200	2.635	6.835
2006[r]	18.476	3.462	21.653	4.211	3.070	7.281
2007[p]	**19.078**	**3.779**	**23.042**	**4.234**	**2.879**	**7.113**

[a] Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

[b] Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

[c] Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

[p] Preliminary.

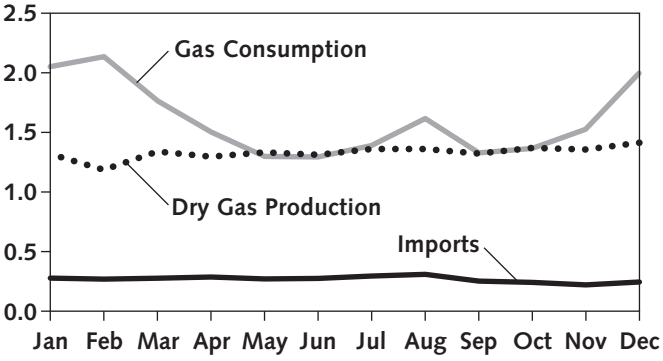
[r] Revised.

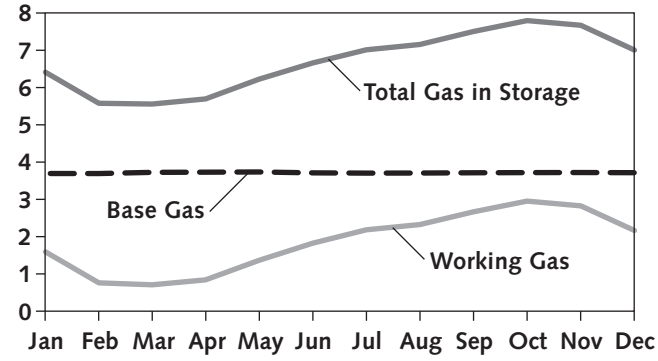
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 4.1 and 4.4. [DOE/EIA-0035 (2008/03)] (March 2008).

United States Monthly Natural Gas Production, Imports, Consumption and Storage, 2007

(Trillions of Cubic Feet)

Domestic natural gas production and imports remain relatively constant throughout the year. However, consumption increases significantly during the winter heating months. To provide sufficient natural gas for the winter heating months, the working gas in storage is withdrawn during these months, while natural gas is injected into storage during the non-heating months. Therefore, natural gas in storage generally peaks in October or November and is at a minimum in March.





2007	U.S. Dry Natural Gas Production[a]	Net Imports	Consumption	Natural Gas in Underground Storage Month End		
				Base Gas[b]	Working Gas[c]	Total
January	1.575	0.326	2.455	4.215	2.379	6.594
February	1.416	0.316	2.555	4.214	1.649	5.863
March	1.600	0.325	2.111	4.242	1.603	5.845
April	1.549	0.337	1.797	4.246	1.720	5.966
May	1.592	0.318	1.551	4.251	2.179	6.430
June	1.568	0.323	1.546	4.230	2.580	6.810
July	1.626	0.347	1.661	4.224	2.894	7.118
August	1.626	0.364	1.932	4.226	3.017	7.243
September	1.580	0.296	1.587	4.232	3.316	7.548
October	1.637	0.283	1.632	4.236	3.567	7.803
November	1.621	0.258	1.825	4.238	3.456	7.694
December	1.689	0.287	2.391	4.234	2.879	7.113
Total	**19.078**	**3.780**	**23.043**			

[a] Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

[b] Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

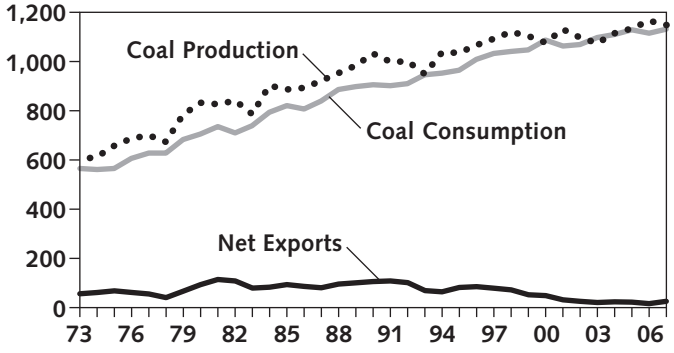
[c] Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

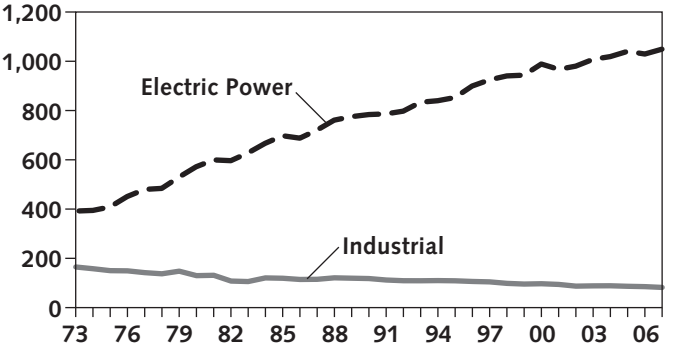
Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 4.1 [DOE/EIA-0035 (2008/03)] (March 2008).

United States Coal Production, Net Exports, Consumption and Sector Usage[r], 1973-2007

(Millions of Tons)

Unlike petroleum or natural gas, domestic production of coal exceeds demand, and the U.S. is a net exporter of coal. More than 92 percent of the coal used in the U.S. is for generating electric power. The Industrial sector uses about 7 percent, with the residential and commercial sectors combined using about 0.3 percent of total domestic consumption.





Year	Coal Production	Net Exports	Consumption	Coal Use by Sector		
				Res. & Com.[a]	Industrial	Electric Power
1973	598.6	53.5	562.6	11.1	162.1	389.2
1975	654.6	65.4	562.6	9.4	147.2	406.0
1980	829.7	90.5	702.7	6.5	127.0	569.3
1985	883.6	90.7	818.0	7.8	116.4	694.8
1990	1,029.1	103.1	902.9	6.7	115.2	781.0
1995	1,033.0	79.1	962.0	5.8	106.1	850.2
2000	1,073.6	46.0	1,084.1	4.1	94.1	985.8
2001	1,127.7	28.9	1,060.1	4.4	91.3	964.4
2002	1,094.3	22.7	1,066.4	4.4	84.4	977.5
2003	1,071.8	18.0	1,094.9	4.2	85.5	1,005.1
2004	1,112.1	20.7	1,107.3	5.1	85.9	1,016.3
2005[r]	1,131.4	19.5	1,126.0	4.7	83.8	1,037.5
2006[r]	1,162.8	13.4	1,112.3	3.2	82.4	1,026.6
2007[p]	**1,145.6**	**22.8**	**1,128.8**	**3.2**	**79.2**	**1,046.4**

[a] Res. & Com. represents residential and commercial.

[p] Preliminary.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 6.1 and 6.2, [DOE/EIA-0035 (2008/03)] (March 2008).

United States Per Capita Resource Energy Consumption, by Type of Fuel[r], 1970-2007

(Millions of Btu)

In 2007, U.S. per capita energy consumption increased 0.65 percent.

Year	Petroleum[a]	Natural Gas	Coal	Nuclear	Renewable[b]	Total[r]
1970	127.0	106.0	60.0	1.0	13.5	307.5
1975	133.0	93.0	59.0	9.0	13.5	307.5
1980	128.0	90.0	68.0	12.0	17.5	315.5
1985	113.0	75.0	74.0	17.0	18.9	297.9
1990	114.0	77.0	76.0	25.0	17.4	309.4
1991	111.0	78.0	74.0	26.0	17.3	306.3
1992	111.0	79.0	74.0	26.0	17.0	307.0
1993	111.0	81.0	76.0	26.0	17.1	311.1
1994	113.0	82.0	75.0	25.4	17.0	312.5
1995	112.0	85.6	75.4	26.6	18.0	317.5
1996	115.0	86.1	78.0	26.3	18.6	324.0
1997	113.4	85.6	78.7	24.2	18.1	319.9
1998	113.2	83.1	78.5	25.6	16.7	317.2
1999	114.5	82.5	77.5	27.3	16.7	318.5
2000	116.0	84.7	80.0	27.9	15.9	324.6
2001	114.5	80.3	76.8	28.0	13.7	313.3
2002	113.1	82.0	76.2	28.5	14.6	314.4
2003[r]	113.7	79.0	76.9	27.5	15.2	312.2
2004[r]	116.3	78.3	77.3	27.9	15.3	315.2
2005[r]	115.9	77.2	77.0	27.5	15.3	312.9
2006[r]	113.4	74.3	75.3	27.5	17.8	308.3
2007	**111.6**	**78.2**	**75.6**	**27.8**	**17.0**	**310.3**

[a] To allow a more direct comparison with Wisconsin data, this figure excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

[b] Renewables includes biomass, biogas, hydro power, wood, solar and wind.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2008/003] (March 2008).

Wisconsin Per Capita Resource Energy Consumption as Percent of United States Per Capita Resource Energy Consumption, by Type of Fuel, 1970-2007

(Percent)

In 2007, Wisconsin used 101 percent as much energy per capita as the national average. Wisconsin used significantly more coal than the national average because of the state's high use of electricity generated from coal. Wisconsin used less petroleum, natural gas, renewable and nuclear energy per capita than the national average.

Year	Petroleum[a]	Natural Gas	Coal	Nuclear	Renewables[b]	Total[c]
1970	82.0	70.0	123.4	33.0	46.0	84.2
1975	78.0	86.0	89.8	276.0	48.1	87.1
1980	75.0	82.0	99.4	189.0	61.5	85.9
1985	77.0	86.0	106.1	143.0	61.5	89.4
1990	80.0	81.0	135.7	100.0	64.3	94.6
1995	82.7	86.8	153.1	86.9	65.8	99.9
2000	81.5	86.2	144.7	82.8	68.3	97.8
2001	82.3	83.0	155.6	82.0	81.5	100.5
2002	84.3	86.1	147.3	86.8	79.5	100.1
2003	84.0	91.2	146.3	87.6	77.6	101.2
2004	83.1	88.4	148.2	83.5	79.0	100.3
2005	81.3	96.4	152.8	53.7	81.4	100.3
2006	81.8	90.5	141.2	86.6	69.3	98.2
2007[p]	**82.5**	**90.4**	**150.1**	**84.1**	**80.0**	**101.0**

[a] This list excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

[b] Renewables includes biomass, biogas, hydro power, wood, solar and wind.

[c] Total includes geothermal power, electricity produced from wood, and net imports of electricity.

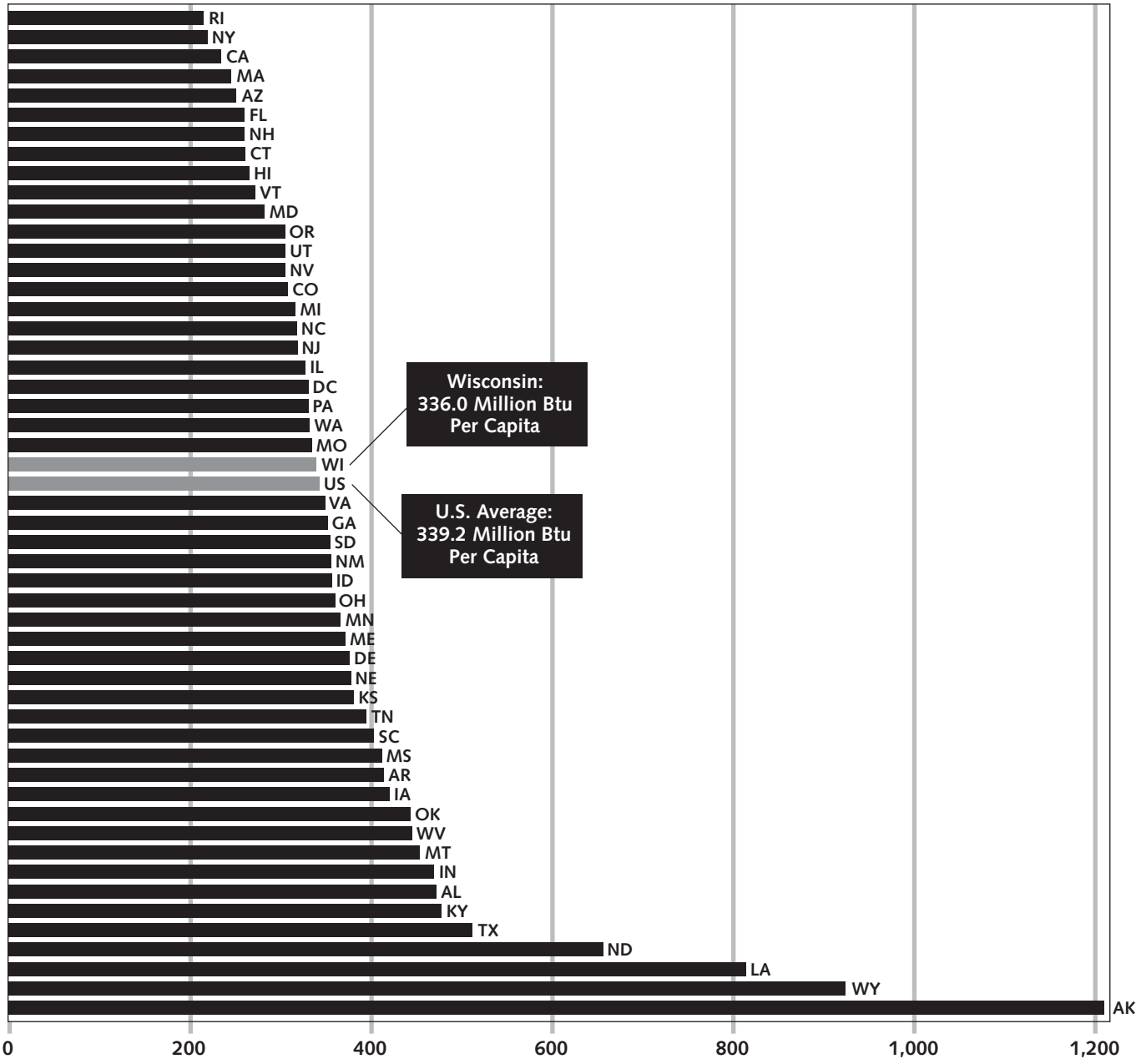
[p] Preliminary estimates.

Source: Compiled from tables in this publication for United States and Wisconsin per capita resource energy use.

U.S. Per Capita Resource Energy Consumption, by State 2005[a]

(Millions of Btu Per Capita)

In 2005, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin ranked as the 28th largest state user in the nation, including the District of Columbia, in per capita energy consumption.



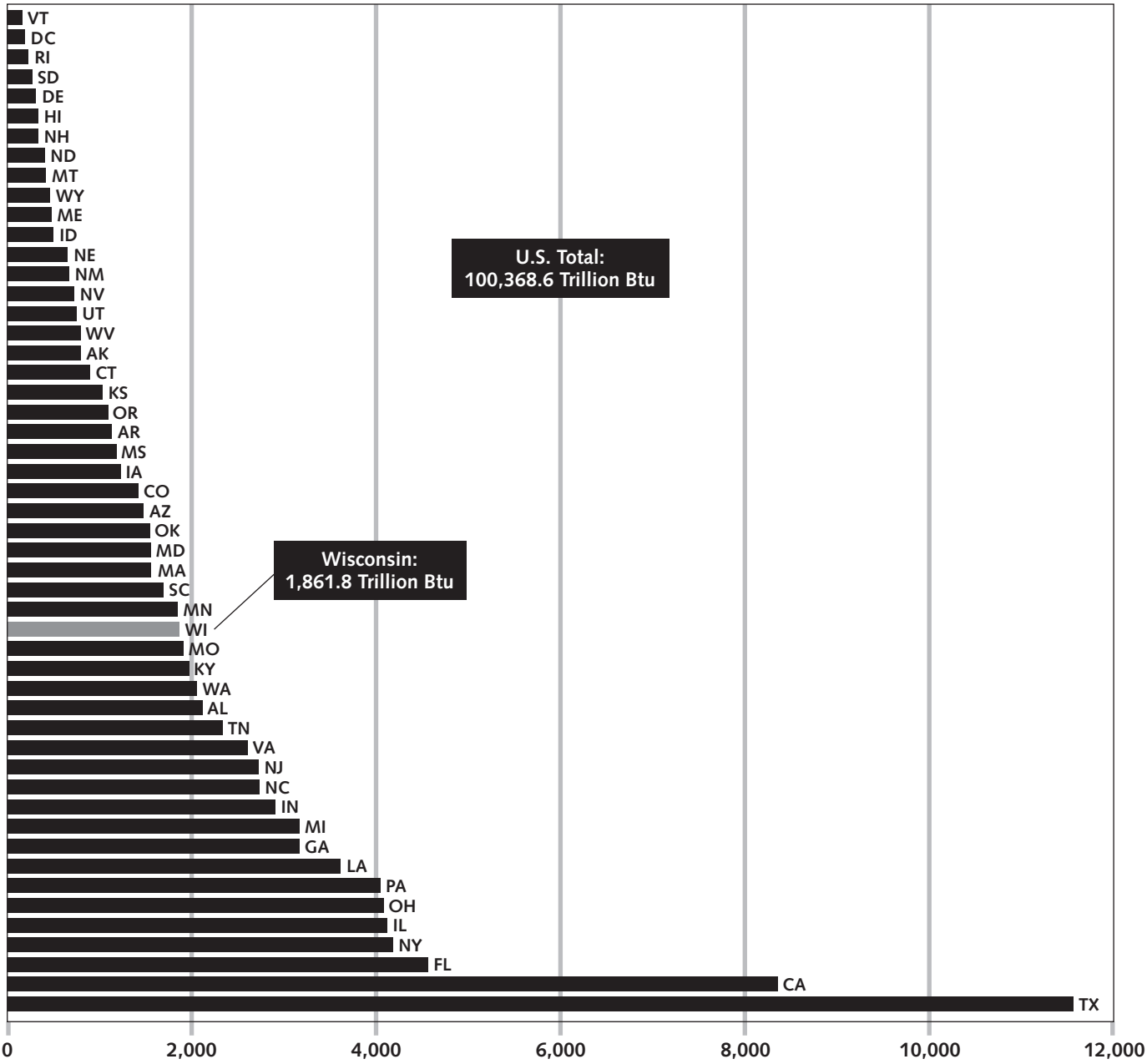
[a] Data reported in this table may differ from other tables because of different sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data 2005: Consumption*, Table R2.

U.S. Resource Energy Consumption, by State 2005[a]

(Trillions of Btu)

In 2005, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin used 1.9 percent of total energy consumed in the United States.



[a] Data reported in this table may differ from other tables because of different sources.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data 2005: Consumption*, Table R1.